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## College of Science and Mathematics Annual Report 2006

College of Science and Mathematics

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**College of  
Science and  
Mathematics**

**Opening Minds  
to Science**

## Annual Report Highlights



**2006**

## Contents

- College summary and statistical snapshot
- Biochemistry and Molecular Biology
- Biological Sciences
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- Neuroscience, Cell Biology, and Physiology
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- Psychology
- Statistical Consulting Center

## On the Cover:

**Top:** Artist's drawing of the Matthew O. Diggs III Laboratory for Life Science Research, which is scheduled to open in the fall of 2007.

**Bottom:** Renovated Brehm Laboratory, opened summer 2007.

## A Message from the Dean

It is with great pride that I present to you the College of Science and Mathematics (CoSM) 2006 annual report. We are proud of our successes over the past five years. To help focus our efforts while building on that momentum, we initiated an intensive strategic planning exercise over the past academic year which will result in the unveiling of an ambitious new 5 year plan titled *Opening Minds to Science*. This plan involved all CoSM departments along with the college office. Many faculty and staff were enthusiastically engaged in the process. More details on this planning exercise are provided later in this report.

In 2006 annual report highlights provides an overview of the College's accomplishments, initiatives, and events; an web archive of documented achievements within each academic unit can be found [here](#).

CoSM faculty and research associates published 212 papers and books, and presented at 321 professional meetings and conferences. Faculty were active on editorial boards (26) and in study sections (39). Many faculty held offices in national professional organizations (38).

According the University Fact Book, the Fall 2006 CoSM student body stood at 1314 undergraduates and 351 graduates. Biological Sciences and Psychology continue to be our largest departments in terms of enrollment. Our undergraduate student population is quite diverse (61 % women; 25 % minority).

In addition to the university allocated funding, the college obtained \$8.6 million in research funding through 137 grants/contracts between June 30, 2006 and July 1, 2007, a 26% increase over the previous period. CoSM's extramural funding constitutes 12% of the University's total \$72.0 million research budget. Five inventions were disclosed by COSM faculty in the last 3 years, with 2 patent applications and one provisional patent application pending.

Construction of the new Matthew O. Diggs III Laboratory for Life Science Research building progressed rapidly and a late fall 2007 opening is anticipated. The Brehm renovation is underway and a fall 2007 reopening is expected.



**Michele Wheatly, Dean**

**Dan Voss, Associate Dean**  
**Stacia Edwards, Assistant Dean**  
**Joyce Howes, Assistant Dean**  
**Michael Reynolds, Assistant Dean**  
**Karen Laycock, Business Manager**

### Department Chairs /Program Directors

Daniel Organisciak,  
Biochemistry and Molecular Biology

David L. Goldstein,  
Biological Sciences

Gerald Alter,  
Biomedical Sciences Ph.D. Program

Kenneth Turnbull,  
Chemistry

G. Allen Burton,  
Earth and Environmental Sciences

Don Cipollini,  
Environmental Sciences Ph.D. Program

Joanne Dombrowski,  
Mathematics and Statistics

Timothy Cope, Neuroscience, Cell Biology,  
and Physiology

Lok C. Lew Yan Voon, Physics

John Flach, Psychology

### Enrollment

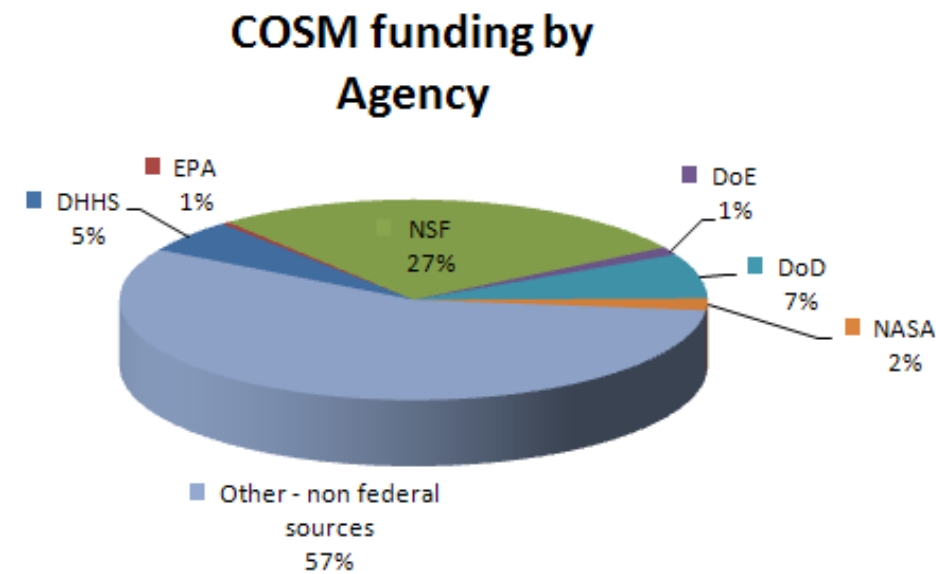
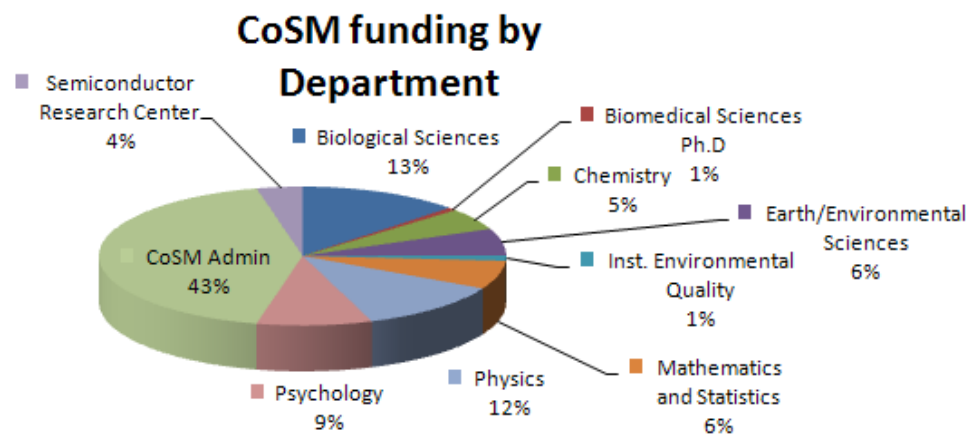
	Undergraduate	Graduate
Fall '05	1320	344
Fall '06	1314	344

With outstanding faculty and students, CoSM is poised to assist the State of Ohio in growing STEM prepared graduates who will lead the State and Nation in the economic recovery.



**Michele Wheatly, Ph.D**  
Dean, College of Science and Mathematics

### Extramural Funding



### Undergraduate Enrollment by Department

	Fall 05	Fall 06
Biological Sciences	481	468
Chemistry	100	103
Earth and Environmental Sciences	48	56
Mathematics & Statistics	60	62
Physics	15	21
Psychology	489	469
Integrated Science	13	15
Undeclared	114	120

## Departmental Summaries

Biochemistry and Molecular Biology  
Biological Sciences  
Chemistry  
Geological Sciences  
Mathematics and Statistics  
Neuroscience, Cell Biology, and Physiology  
Physics  
Psychology

## Biochemistry and Molecular Biology

Biochemistry and Molecular Biology is one of two departments that have a matrix relationship to the Boonshoft School of Medicine. The department is currently chaired by Daniel T. Organisciak, Ph.D. but a search has been initiated for a new chair.

The Department of Biochemistry and Molecular Biology (BMB) was founded in 1974 concurrently with the creation of the Wright State University School of Medicine and has recruited faculty with strong research interests in the basic biomedical sciences. Fourteen faculty are located in the department as are several post doctoral researchers, Ph.D students and M.S. students.

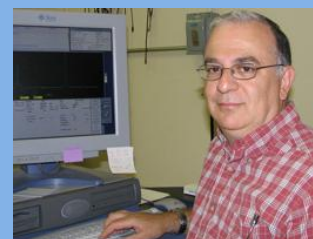
Major research interests of the department are grouped into three interrelated areas: macromolecular mechanisms, molecular genetics, and the application of nuclear magnetic resonance to biomedical research.

The department faculty were quite active again this year publishing and presenting their work. Participation on study section panels was likewise strong with six faculty serving on 13 panels. The faculty are active on a national level as office holders in professional organizations. For example, Dr. Prochaska was recently elected Chairman of the Bioenergetics Subgroup of the Biophyscial Society.

Last year, Cheryl Little received the President's Award for Excellence in Leadership. Dr. Nicholas Reo received the SOM Student's Teaching Award.



Dr. Daniel Organisciak



Dr. Nicholas Reo

### *Research Funding*

Award Amount	Number of awards
\$1,806,802	13



## Biological Sciences

The Department of Biological Sciences, chaired by David Goldstein, is one of the largest departments in the college. Offering a broad, integrated, and in-depth approach to the life sciences, the department has approximately 500 undergraduate and 40 graduate students. More than 130 Bachelors and 20 graduate degrees (Master's and Ph.D.) are usually awarded per year. The faculty consists of approximately 20 tenure track faculty with over a million dollars in research productivity and expertise in areas such as animal and exercise physiology, cell and molecular biology, toxicology, parasitology, and aquatic ecology.

The Biological Sciences faculty were productive in communicating their research, with more than 35 publications in professional journals and 50 conference presentations in 2006, and with frequent invitations (14) to participate in or chair national and international symposia.

“Creationism, Intelligent Design, Evolution—What Should We Teach?” Eugenie C. Scott, Ph.D., discussed the scientific, educational, historical, legal, religious, and social aspects of this debate. Students, parents, teachers, and administrators will learn how to address questions and concerns about these thought-provoking topics.

The author of *Evolution vs. Creationism: An Introduction*, Dr. Scott is executive director of the National Center for Science Education, a nonprofit organization based in Oakland, California, that works to educate the press and public about the creationism and evolution controversy and to promote rigorous science education. A former university professor, Dr. Scott has brought her insights as both a researcher and an activist to the creationism/evolution debate for over 20 years.

Yvonne Vadeboncoeur, Assistant Professor, is a collaborating scientist in the Research Coordination Network (RCN) which was



David Goldstein

### Research Funding

Award Amount	Number of awards
\$1,110,610	31



Eugenie C. Scott, Ph.D.



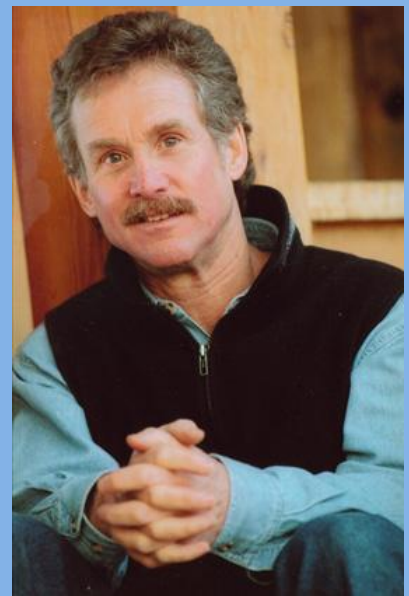
recently approved for funding by the National Science Foundation. This RCN involves experts in information technology, lake ecology, and lake physics, who will collectively evaluate data provided by sensors in lakes world-wide.

David Goldstein, Chair of the Comparative and Evolutionary Physiology Section of the American Physiological Society (APS), organized and convened an APS conference in Comparative Physiology that attracted nearly 400 scientists from more than 20 countries to Virginia Beach, VA. The conference featured 5 plenary lectures by renowned scientists. Twenty symposium sessions covered topics ranging from mechanisms of aging to fueling and design of muscles, and from the biology of fishes in extreme environments to biomedical applications of suspended animation.

David Quammen, award-winning author and journalist, visited WSU this last year and spoke to a large audience from the community on Charles Darwin and the development of his thinking. Quammen has published widely in magazines like National Geographic, Harpers, Outdoor, and elsewhere.

Tim Wood, Emeritus Professor of Biology, received a Senior Specialist Award from the Council for the International Exchange of Scholars (CIES) Fulbright Program. The award allows Wood to continue his collaborative efforts with Kasetsart University in Bangkok, Thailand. In addition to further studies of bryozoans, which have been ongoing for the past several years, the Fulbright award will involve contributions to developing a new Master's program in environmental sciences, and to instituting a program of freshwater ecology more generally.

In 2006, Gwyn Isenhouer & Kathryn Barto were awarded GRO fellowships ("Greater Research Opportunities") from the US EPA. These fellowships, which provide stipend, tuition, and research funds, are highly competitive. The figure is less than 10% funding rate--and so for two of them to come to Wright State in one year is outstanding--as, to be sure, are the students who have earned them.



David Quammen

Dr. Larry Arlian received a five year grant from the National Institutes of Health - National Institute of Allergy and Infectious Diseases (NIAID) in the amount of \$1,793,750 (“Scabies: Biology, Culture, Host Specificity and Antigens”).

## Chemistry

The Department of Chemistry offices are located on the second floor of Oelman Hall, with faculty offices on the second and fourth floors. Upper division teaching and research laboratories are distributed on the first, second, and fourth floors. Fawcett Hall, houses the first year teaching laboratories. Recently, with the complete renovation of the Brehm Laboratory, seven new, state-of-the-art teaching laboratories have become available.

The department faculty perform research in a broad range of chemical fields such as analytical, physical, organic, inorganic, polymer and environmental chemistry, X-ray crystallography, and education. The faculty are very active researchers (22 refereed publications, 56 publications) and travel internationally to discuss their work at professional conferences, other universities, and workshops. Several faculty are on journal editorial boards (8) and review panels for national agencies (5). Additionally, department faculty are active with state committees working to improve undergraduate education.

The Third Annual Procter and Gamble Lecture featured Professor Craig Hawker of the University of California, Santa Barbara. Professor Hawker, a world-renowned leader in the area of materials' chemistry, presented an exhilarating talk entitled "Commercial Exploitation of Nanostructures: Studies at the Interface of Organic and Materials Chemistry". A joint venture with the Mineralogical Society of America (MSA) and the WSU Department of Earth and Environmental Sciences, featured Professor Tim Lowenstein from Binghamton University as the 2006 *MSA Distinguished Lecturer*. Professor Lowenstein presented two fascinating lectures, "Reviving Ancient Organisms in Crystals: Jurassic Park of Fantastic Lark?" and "Tracking changes in the chemistry of ancient seawater: Mammal blood, Salt, and Sea Shells."



Kenneth Turnbull

### Research Funding

Award Amount	Number of awards
\$1,248,085	30



Craig Hawker

Chemistry department students received numerous awards for their work. Benjamin Southerland won a WSU Graduate Council scholarship and a Regents Fellowship. Kirby Underwood won the award for Outstanding Graduate Student, Outstanding Graduate Teaching Assistant and Outstanding Graduate Poster at the Annual Poster Session of the Dayton Section ACS. Amanda Ike and Brian Werry received teaching awards. Gail Dean and Pragathi Kadirir won Outstanding Poster awards.

The Chem Demo program, led by Professors Emeriti Rubin Battino and John Fortman, reaches roughly 8,000 high school, junior high, and grade school students each year with multiple presentations in December and March. It appears to be the largest chemistry outreach program in the nation (and possibly the world). Students are shown demonstrations of exciting chemical phenomena, with a lively dialog of information and humor.

## Earth and Environmental Sciences

The former Department of Geological Sciences and the Institute of Environmental Quality of WSU were merged into one unit effective July 1, 2006, and renamed the Department of Earth & Environmental Sciences. The department consists of 17 faculty and several support staff.

It is an exciting period of growth for the department in the following key areas: (a) a multi-million dollar renovation of our building (Brehm Laboratory) to be completed in summer 2007; (b) the hiring of several new faculty, a postdoctoral fellow, and instructors; (c) addition of staff due to the merger of Institute for Environmental Quality and the Department of Geological Sciences; and (d) the ongoing development of new research laboratories and facilities.

Departmental faculty were active publishers (15) and presenters (24) of their research; the faculty are office level members of several national and international professional organizations (17).

The department has begun extensive talks with Houston area alumni, many whom are in the petrochemical industry. The early talks have been very beneficial to the department; a multi-million dollar gift in kind was received from Schlumberger. Ongoing discussions with petrochemical company executives have resulted in collaborative research programs.



Allen Burton

### *Research Funding*

Award Amount	Number of awards
\$537,454	13

## Mathematics and Statistics

The Department of Mathematics and Statistics is one of the largest on campus, with 33 faculty and several fulltime staff. The department offers both a Bachelor's and Master's degree in the mathematical sciences (pure mathematics, applied mathematics, computing-related mathematics, statistics, and mathematics education.) The department also teaches dozens of classes for students majoring in other departments. Altogether, the department teaches over 8,000 students and 36,000 credit hours annually.

The department has a long history of strong scholarship from its professorial-rank faculty. This scholarly productivity is evidenced by the number of publications in distinguished journals (29) and presentations (46). External research funding is well beyond what is typical for a mathematical sciences department not offering a Ph.D. program.

The service work of the department is extensive. The department's Statistical Consulting Center (SCC) is, in fact, a service unit for the rest of the university and the external community. The mathematics education faculty, who oversee the most rapidly growing component of the department's teaching mission, have helped form state policy in education by serving on the Governor's Commission on Teaching Success, the writing teams for Ohio's Academic Content Standards for K-12 Mathematics and Ohio's Teaching Standards, and as Ohio Board of Regents Teaching Fellows.



Joanne Dombrowski

### *Research Funding*

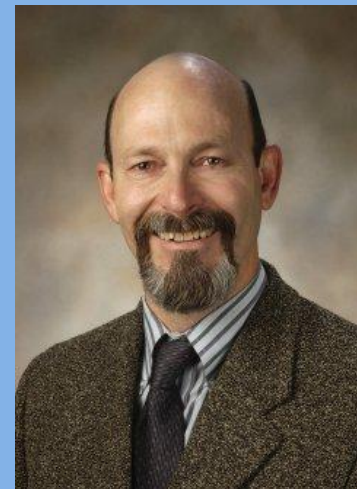
Award Amount	Number of awards
\$571,597	7

## Neuroscience, Cell Biology and Physiology

The Department of Neuroscience, Cell Biology, and Physiology (NCBP) is affiliated with both the Boonshoft School of Medicine and the College of Science and Mathematics. The department's research laboratories are highly active (nearly \$2 million in extramural funding), with faculty members who are world leaders in their field; research areas can be divided into three groups, but interests and skills frequently overlap. Research in neuroscience focuses on function and structure of the normal and injured spinal cord, brainstem, and peripheral nervous system. This work is directly relevant to studies involving trauma and diseases (e.g., critical illness myopathy, SIDS, sleep apnea). In the area of cell biology, focus is on the immune system, viral infection, and therapies that will impact heart disease, cancer, AIDS, and autoimmune disease. The contributions in physiology include studies dealing with conditions such as colitis, cystic fibrosis, and tumor growth.

There are currently 20 faculty in the department. There were 20 publications in refereed journals last year and 22 presentations/invited talks. Eight faculty had extramural National Institutes of Health funding totaling nearly \$1.9 million. NCBP faculty sat on 13 national grant review panels including the National Institutes of Health and the American Heart Association.

NCBP faculty are heavily involved in teaching at all levels of the university—undergraduate, graduate, and especially medical school education. Last year, 17 faculty taught in 12 of the 14 major courses included in the first biennium of the medical school curriculum. Five faculty served as directors of 7 courses. NCBP faculty provided significant contributions to the laboratory research training of doctoral students in the Biomedical Sciences Ph.D. Program, along with classroom teaching and course directorships. Thirteen faculty taught in core courses in the two



Timothy Cope

### *Research Funding*

Award Amount	Number of awards
\$1,875,415	12



Master's degree programs that the NCBP department offers. Two faculty co-directed the newly integrated undergraduate anatomy and physiology courses.

The department faculty are extremely active in the outreach area. The department's Exploring Human Anatomy (an Interactive Anatomy Lab Experience) welcomed over 1,000 high school and technical college students last year.

## Physics

The Department of Physics is housed in Fawcett Hall and operates research facilities in the Mathematics and Microbiology building and on Wright Patterson Air Force Base (Semiconductor Research Center). The Department offers undergraduate and graduate degrees.

There are 13 tenure-track faculty, three adjunct professors, two instructors, and four research faculty. Areas of concentration and strength include semiconductors, nanostructures, atmospheric physics, submillimeter-wave THz and NMR spectroscopy, geophysics, environmental physics, medical physics, physics education research, and mathematical physics.

The department offers B.S. and B.A. degrees in physics, engineering physics, physics education, and a dual program with mathematics. The department has about 25 undergraduate physics majors, 29 in engineering physics and 9 graduate students. Graduate degrees include the M.S. in Physics and a Masters of Science in Teaching (M.S.T.).

The department faculty wrote 45 refereed papers last year and made 44 presentations of their work. Ten research grants were awarded totaling over \$1 million dollars.



Lok C. Lew Yan Voon

### *Research Funding*

Award Amount	Number of awards
\$1,015,433	10

## Psychology

The Department of Psychology (the only comprehensive department in the CoSM) offers B.A. and B.S. degrees in psychology and M.S. and Ph.D. degrees in Human Factors and Industrial/Organizational Psychology (HF/IO). The department has 21 tenure track faculty, 10 adjunct professors, 4 instructors, and two emeritus faculty. Faculty research resulted in 24 refereed articles and 44 conference presentations in 2006.

The undergraduate program has the largest enrollment in the college and continues to grow at the fastest rate. The undergraduate program is designed to expose students to current theory and research in diverse areas of psychology. In addition, students learn the fundamentals of research design and mathematical/statistical skills needed to appreciate psychological science. The B.S. program provides more advanced knowledge of design and methods with more concentrated study in specific areas of psychology. The B.S. program is ideal for students who plan to pursue graduate education in psychology or other fields (e.g., medical or law school).

The HF/IO graduate program is designed to prepare students to apply principles of psychology to the design of advanced technologies and to the management of complex organizations. Students specialize in either HF/IO psychology and take complementary course work in the second discipline. This blend provides a unique perspective on problems associated with Human Systems Integration in work organizations; and positions the department to contribute to multidisciplinary initiatives within the university and with local industry to address the role of humans in complex socio-technical systems.

Currently, there are over 55 students participating in the graduate program. Approximately, 20 of these students are supported as Graduate Teaching Assistants, 18 are supported through faculty research grants or research fellowships and the remainder work in local industries.



John Flach

### *Research Funding*

Award Amount	Number of awards
\$792,299	20

## Statistical Consulting Center

The Statistical Consulting Center (SCC) provides statistical consulting services to both internal and external clients; SCC staff worked with 155 clients in 2006, up 29% from 2005. The COSM was the heaviest user of our services (30% of consulting hours), followed by the BSOM (23%), external clients (13%), the CONH (13%), and the Administration (9%). Forty-three percent of our clients were faculty and 26% were graduate students or BSOM residents/fellows.

The SCC provided service to 25 external clients in 2006, including affiliations with, among others, Wright-Patt Air Force Base, Regional Transit Authority, MCM Co., Sebaly, Shillito, and Dyer Law Offices, The Lakatos Group, Ltd., Springfield City Schools, Community Blood Center, Center for Election Integrity, Minot State University, Mercy Medical Center, Uppsala University School of Medicine (Sweden), and Umeå University (Sweden).

The SCC has gained a national reputation as evidenced by the invitation by the editor of "The Statistical Consultant," a publication of the Statistical Consulting Section of the American Statistical Association, to submit an article describing the WSU SCC (Vol. 23, No. 1, 2006).



Harry Khamis

## Summary

A detailed appendix containing bibliographic details for each department is available online at

[http://wright.edu/cosm/facts/06/Appendix\\_CoSM\\_Annual\\_Report.pdf](http://wright.edu/cosm/facts/06/Appendix_CoSM_Annual_Report.pdf)



# College of Science and Mathematics

## Opening Minds to Science

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